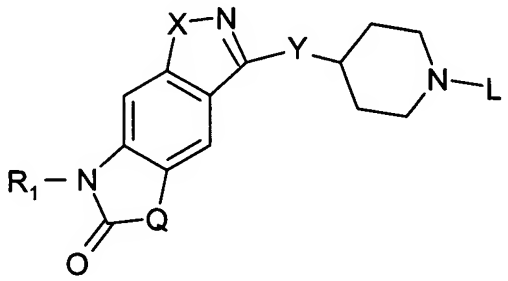
IN THE CLAIMS:

1-5.(Cancelled)

6.(Currently Amended) A method for diagnosing, estimating the severity of, or monitoring the progression of disease in a human dementia ~~in a~~ patient, comprising:

(a) administering to the patient a detectable amount of a compound of a general formula I



I

or a pharmaceutically acceptable salt thereof, the compound comprising one or more radioisotopic atoms selected from the group consisting of carbon-11, fluorine-18, iodine-123, and bromine-76, wherein:

Q is $-(CH_2)_m-$, -CH=CH-, $-CHCH_3$, $-C(CH_3)_2$, oxygen, sulfur, or $-NR^2$;

X is oxygen or sulfur;

Y is $-(CH_2)_n-$;

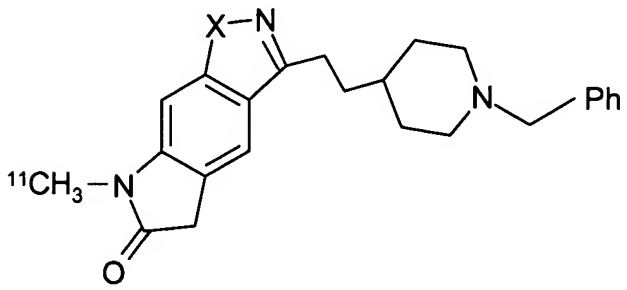
L is phenyl or $-(C_1-C_6)$alkyl-phenyl, wherein said phenyl is optionally substituted with one or more $-(C_1-C_6)$alkyl or halo groups;

R^1 is $-(C_1-C_6)$alkyl;

R^2 is hydrogen or –$(C_1$-$C_6)$alkyl; and

n and m are independent integers ranging from 1 to 3;

with a proviso that the compound is not that of formula II



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(b) imaging the brain of the patient to generate a brain image showing a distribution and relative amounts of acetylcholinesterase in the brain; and.

(c) relating the brain image of the human to the presence or absence or degree of severity of progression of said demential.

7.(Original) The method of claim 6, wherein the dementia is Alzheimer's disease.

8.(Original) The method of claim 6, wherein the compound is administered intravenously.

9.(Original) The method of claim 6, wherein the compound comprises a carbon-11 atom.

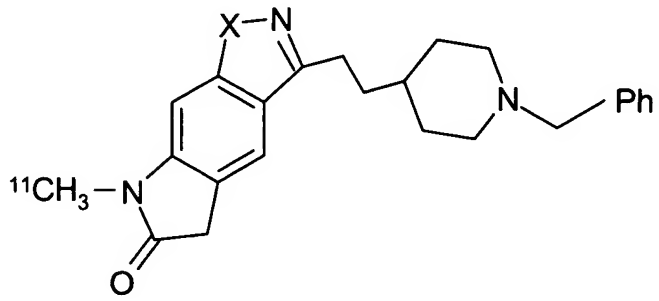
10.(Original) The method of claim 9, wherein R^1 comprises the carbon-11 atom.

11.(Original) The method of claim 6, wherein the imaging comprises performing PET or SPECT.

12-14.(Cancelled)

15.(Currently Amended) A method for diagnosing, estimating the severity of, or monitoring the progression of disease in a human dementia ~~in a~~ patient, comprising:

(a) administering to the patient a detectable amount of a compound of a formula II



II

or a pharmaceutically acceptable salt thereof; and

(b) imaging a brain of the patient to generate a brain image showing a distribution and relative amounts of acetylcholinesterase in the brain; and~~.~~

(c) relating the brain image of the human to the presence or absence or degree of severity or progression of said dementia.

16.(Original) The method of claim 15, wherein the dementia is Alzheimer's disease.

17.(Original) The method of claim 15, wherein the compound is administered intravenously.

18.(Original) The method of claim 15, wherein the imaging comprises performing PET or SPECT.